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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,259	01/02/2002	Anna Charny	CISCP731	7467

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EXAMINER	
SERRAO, RANODHI N	
ART UNIT	PAPER NUMBER
2141	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/038,259	CHARNY ET AL.	
	Examiner	Art Unit	
	Ranodhi Serrao	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9,11,12,14-16,18-22,24,25 and 27-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-9,11,12,14-16,18-22,24,25 and 27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12 July 2007 have been fully considered but they are not persuasive.

2. The applicant argued,

> Huang does not discuss bandwidth to be protected of a link pair. Instead, Huang is concerned with a backup path for a failed link (e.g., 104AB). The nodes at the ends of the link (e.g., 102A, 102B) are used in the backup path. In contrast to Huang, applicants' invention is directed to protecting a node and providing backup for a link pair traversing the node. Since Huang does not address protecting bandwidth of a link pair, there is no discussion of bandwidth to be protected comprising a lesser of primary bandwidths of a link pair traversing a node to be protected, as set forth in the claims.

3. The examiner respectfully disagrees. In ¶ 32, Huang states, "A backup LSP may be set up between the head end node 102A and the tail end node 102B to protect each of the **working links** in the **working bundle** such that, in the event of a failure in the fiber, each of the **working links** in the **working bundle** may be switched to corresponding individual backup LSPs, i.e., **a backup bundle**." Emphasis added. As can be clearly seen from the above, Huang discloses bandwidth to be protected of a link pair (a backup bundle of the working bundle).

4. The applicant further argued,

> The only bandwidth Huang is concerned with is the bandwidth required to cover a link failure between two nodes (e.g., link 104AB between nodes 102A and 102B). Huang protects a path segment (e.g., link) and uses only a single bandwidth value for the path segment, therefore, there is no pair of links to select between.

5. This is incorrect since Huang discusses links between nodes 102Y and 102P, 102X and 102Q, and 102Z and 102R. There is clearly more than one link traversing the nodes. Furthermore, in ¶ 37 Huang states, "Consider a scenario wherein the head end

node 102A unsuccessfully attempts to reserve further bandwidth on the previously established backup route (through nodes 102C, 102D and 102E). The head end node 102A may instead set up a backup LSP through nodes 102J and 102K. Further working links may be logically associated with the third working link on this backup route to form a second backup bundle." Therefore there are multiple links traversing node 102A such as 104YA-104AB-104BP, 104XA-104AC-104CD-104DE-104EB-104BQ, 104ZA-104AJ-104JK-104BK-104BR, etc. Hence Huang teaches the invention as claimed.

6. The applicant also argued,

> Kinoshita et al. check to see if the required bandwidth is available and do not set up backup tunnels that consume more bandwidth than provided by a link's backup bandwidth pool.

7. In ¶ 131, Kinoshita clearly describes backup tunnels that consume more bandwidth than provided by a link's backup bandwidth pool. Kinoshita states, "To secure resources for the protection path, the path setup/release control section 60 notifies the resource control section 64 accordingly.... If the bandwidth needs to be increased as a result of the bandwidth sharing, the resource control section 64 checks to see if the bandwidth can be assigned to that port and, if the check proves OK, secures the bandwidth and reports the result to the path setup/release control section 60." If the bandwidth needs to be increased, this means that protection paths (or backup tunnels) consume more bandwidth than provided by a link's backup bandwidth pool. Therefore Kinoshita teaches the invention as claimed.

8. Moreover, the applicant argued,

> In contrast to Kawamura, the backup tunnels of applicants' invention consume bandwidth from backup bandwidth pools of links. There is no signaling of backup bandwidth reservation for the backup tunnels from one node to another node - that is the

> backup tunnels are signaled with zero bandwidth. The backup bandwidth used by the backup tunnels for one node may therefore also be used by backup tunnels that protect other nodes. This is different than the virtual path of the ATM networks in Kawamura which assign the bandwidth of a virtual path at a node rather than assigning bandwidth along the path of the VP.

9. The examiner points out that Kawamura is not cited to teach that backup tunnels consume bandwidth from backup bandwidth pools of links, Kinoshita is. Kawamura clearly teaches wherein establishing backup paths comprises signaling said backup paths with zero bandwidth to adjacent nodes of each protected node ("Consequently, a VP route can be established without assigning its bandwidth along the path; in other words, **assigning zero bandwidth** is possible. The proposed algorithm **uses zero bandwidth VP's as backup VP's**." Emphasis added. See Kawamura, page 121, column 1.) Furthermore, in page 121, column 2, Kawamura states, "The bandwidth of a backup VP is set at zero. The backup VP can be assigned **between any pair of nodes** on a VP route." Emphasis added. Contrary to the applicant's statement, Kawamura is certainly assigning bandwidth along the path of a VP not just a node. See figure 3. Accordingly, Kawamura teaches the invention as claimed.

10. In conclusion, upon taking the broadest reasonable interpretation of the claims, the cited references teach all of the claimed limitations. And the rejections are reaffirmed. See below.

11. **Examiner's Note:** Examiner has cited particular columns and line numbers or paragraphs in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing

responses, to fully consider the references in its entirety as potentially teaching of all or part of the claimed invention, as well as the context.

Claim Rejections - 35 USC § 103

12. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

13. Claims 1, 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. (2002/0172149) and Huang (2003/0117950).

14. As per claim 1, Kinoshita et al. teaches in a data communication network, a method for protecting a node, said method comprising processes of: identifying a node to be protected (see Kinoshita et a., ¶ 2); providing a backup bandwidth pool on links of said data communication network (see Kinoshita et al., ¶ 73); identifying a link pair traversing said node to be protected, said link pair having a bandwidth to be protected (see Kinoshita et a., ¶ 67); establishing as a backup for said link pair a set of one or more backup paths that do not include said node (see Kinoshita et a., ¶ 73) and wherein said one or more backup paths collectively have backup bandwidth greater than or equal to said bandwidth to be protected (see Kinoshita et a., ¶12); deducting, for each link included in said set of paths, from backup bandwidth available for protecting said node, while not deducting from backup bandwidth available for protecting other nodes in said data communication network (see Kinoshita et a., ¶ 116); and repeating said processes of identifying, establishing, and deducting for a plurality of link pairs traversing said node without exceeding available backup bandwidth of links used in

establishing said backups (see Kinoshita et a., ¶ 126). But fails to teach wherein said bandwidth to be protected of said link pair comprises a lesser of primary bandwidths of links of said link pair traversing said node to be protected. However, Huang teaches wherein said bandwidth to be protected of said link pair comprises a lesser of primary bandwidths of links of said link pair traversing said node to be protected (see Huang, ¶ 35-40). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kinoshita et al. to wherein said bandwidth to be protected of said link pair comprises a lesser of primary bandwidths of links of said link pair traversing said node to be protected in order to prevent finding an entirely new path to avoid a single failure of a path segment in an original path by establishing a backup path at the time of the set up of the original path and, responsive to the single failure, the backup path is used to route traffic around the failed path segment (see Huang, abstract).

15. As per claim 4, Kinoshita et al.-Huang teach a method wherein said set of one or more paths comprises one or more label switched paths (see Kinoshita et al., ¶ 156).

16. As per claim 5, Kinoshita et al.-Huang teach a method wherein said processes of identifying and establishing occur under control of said node (see Kinoshita et al., ¶ 24).

17. As per claim 7, Kinoshita et al.-Huang teach a method further comprising: signaling said backups to other nodes adjacent to said node in said data communication network (see Kinoshita et al., ¶ 68).

18.

19. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. and Huang as applied to claim 1 above, and further in view of Kodialam et al. (2002/0067693).

20. As per claim 3, Kinoshita et al. and Huang teach the mentioned limitations of claim 1 above but fail to teach a method wherein said bandwidth to be protected of said link pair comprises a total bandwidth of LSPs employing said link pair. However, Kodialam et al. teaches a method wherein said bandwidth to be protected of said link pair comprises a total bandwidth of LSPs employing said link pair (see Kodialam et al., ¶ 32). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kinoshita et al. and Huang to a method wherein said bandwidth to be protected of said link pair comprises a total bandwidth of LSPs employing said link pair in order to guarantee minimum bandwidth for the path of a packet flow through the network (see Kodialam et al., ¶ 8).

21. As per claim 6, Kinoshita et al. and Huang teach the mentioned limitations of claim 1 above but fail to teach a method wherein said processes of identifying and establishing occur under control of a computer independent of said node. However, Kodialam et al. teaches a method wherein said processes of identifying and establishing occur under control of a computer independent of said node (see Kodialam et al., ¶ 73). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kinoshita et al. and Huang to a method wherein said processes of identifying and establishing occur under control of a computer independent of said node

in order to route data through a network having a plurality of nodes interconnected by a plurality of links represented by a graph (see Kodialam et al., ¶ 15).

22. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. and Ryutaro Kawamura, Ken-ichi Sato, and Ikuo Tokizawa, "Self-Healing ATM Networks Based on Virtual Path Concept," January 1994, IEEE, Vol. 12, No. 1, pages 120-127 (hereinafter referred to as Kawamura).

23. As per claim 8, Kinoshita et al. teaches a method for operating a data communication network to provide protection to nodes in said data communication network, said method comprising: maintaining, for each of a plurality of links in said data communication network, a primary bandwidth pool and a backup bandwidth pool (see Kinoshita et al., ¶ 73); and establishing backup tunnels to protect a plurality of nodes of said network (see Kinoshita et al., ¶ 156), each of said backup tunnels consuming backup bandwidth from backup bandwidth pools of selected ones of said plurality of links (see Kinoshita et al., ¶ 12); and wherein all backup tunnels protecting any particular node of said network do not consume more bandwidth on any link than provided by the link's backup bandwidth pool (see Kinoshita et al., ¶ 116) but wherein there is at least one set of backup tunnels that protect disparate nodes and that consume more bandwidth on at least one link than provided by said at least one link's backup bandwidth pool (see Kinoshita et al., ¶186). But fails to teach wherein establishing backup tunnels comprises signaling said backup tunnels with zero bandwidth to adjacent nodes of each protected node. However, Kawamura teaches

wherein establishing backup paths comprises signaling said backup paths with zero bandwidth to adjacent nodes of each protected node (see Kawamura, page 121, col. 2). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kinoshita et al. to wherein establishing backup paths comprises signaling said backup paths with zero bandwidth to adjacent nodes of each protected node in order to simplify the message transmission process and reduce the number of generated messages by using preassigned backup virtual paths (see Kawamura, abstract).

24. As per claim 9, Kinoshita et al. and Kawamura teach a method wherein at least one of said backup tunnels comprises a label switched path (see Kinoshita et al., ¶ 156).

25. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura and Kinoshita et al. as applied to claim 8 above, and further in view of Kodialam et al. Kinoshita et al. and Kawamura teach the mentioned limitations of claim 8 above but fail to teach a method wherein establishing backup tunnels comprises: performing backup tunnel selection computations at each protected node for that protected node. However, Kodialam et al. teaches a method wherein establishing backup tunnels comprises: performing backup tunnel selection computations at each protected node for that protected node (see Kodialam et al. ¶ 28). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kawamura and Kinoshita et al. to a method wherein establishing backup tunnels

comprises: performing backup tunnel selection computations at each protected node for that protected node in order to reserve link bandwidth and establish an NTP (see Kodialam et al., ¶ 8).

26. Claims 12, 14-16, 18-22, 24-25, and 27-31 have similar limitations as to claims 1, 3-9, and 11 above; therefore, they are being rejected under the same rationale.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ranodhi Serrao whose telephone number is (571)272-7967. The examiner can normally be reached on 8:00-4:30pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571)272-3880. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RNS
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8/17/2007

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